Analytical Laboratory

13339 Hagers Ferry Road
Huntersville, NC 28078-7929
McGuire Nuclear Complex - MG03A2
Phone: 980-875-5245 Fax: 980-875-4349

Order Summary Report

Order Number: **J12060052**

Project Name: N/A

Customer Name(s): Bill K, Wayne C, Melonie M, Ron L., and Ted M.

Customer Address: 3195 Pine Hall Rd
Mailcode: Belews Steam Station
Belews Creek, NC 28012

Lab Contact: Jason C Perkins Phone: 980-875-5348

Report Authorized By: (Signature) Digitally signed by jay perkins DN: cn=jay perkins, o=Analytical Lab, ou, email=jay.perkins@duke-energy.com, c=US Date: 2012.06.15 14:47:21 -04'00'

Date: 6/14/2012

Program Comments:

Please contact the Program Manager (Jason C Perkins) with any questions regarding this report.

Data Flags & Calculations:

Any analytical tests or individual analytes within a test flagged with a Qualifier indicate a deviation from the method quality system or quality control requirement. The qualifier description is found at the end of the Certificate of Analysis (sample results) under the qualifiers heading. All results are reported on a dry weight basis unless otherwise noted.

Data Package:

This data package includes analytical results that are applicable only to the samples described in this narrative. An estimation of the uncertainty of measurement for the results in the report is available upon request. This report shall not be reproduced, except in full, without the written consent of the Analytical Laboratory. Please contact the Analytical laboratory with any questions. The order of individual sections within this report is as follows:

Job Summary Report, Sample Identification, Technical Validation of Data Package, Analytical Laboratory Certificate of Analysis, Analytical Laboratory QC Reports, Sub-contracted Laboratory Results, Customer Specific Data Sheets, Reports & Documentation, Customer Database Entries, Test Case Narratives, Chain of Custody (COC)

Certification:

The Analytical Laboratory holds the following State Certifications : North Carolina (DENR) Certificate #248, South Carolina (DHEC) Laboratory ID # 99005. Contact the Analytical Laboratory for definitive information about the certification status of specific methods.

Sample ID's & Descriptions:

Sample ID	Plant/Station	Collection Date and Time	Collected By	Sample Description
2012012224	BELEWS	01-Jun-12 7:30 AM	W. B. WORKMAN	FGD Purge Eff
2012012230	BELEWS	01-Jun-12 7:40 AM	W. B. WORKMAN	BIOREACTOR 1 INF
2012012231	BELEWS	01-Jun-12	W. B. WORKMAN	biOREACTOR 1 INF HG BLK
2012012245	BELEWS	01-Jun-12 7:50 AM	W. B. WORKMAN	BIOREACTOR 2 EFF.
2012012246	BELEWS	01-Jun-12	W. B. WORKMAN	BIOREACTOR 2 EFF. BLANK
2012012247	BELEWS	01-Jun-12 8:00 AM	W. B. WORKMAN	FILTER BLANK
2012012265	BELEWS	01-Jun-12 8:10 AM	W. B. WORKMAN	METALS TRIP BLANK

7 Total Samples

Technical Validation Review

Checklist:

COC and .pdf report are in agreement with sample totals and analyses (compliance programs and procedures).	☑ Yes	☐ No
All Results are less than the laboratory reporting limits.	☐ Yes	☑ No
All laboratory QA/QC requirements are acceptable.	☑ Yes	☐ No
The Vendor Laboratories have been qualified by the Analytical Laboratory	Yes	

Report Sections Included:

- ☑ Job Summary Report
- ☑ Sample Identification
- ☑ Technical Validation of Data Package
- ☑ Analytical Laboratory Certificate of Analysis
- ☐ Analytical Laboratory QC Report
- ☑ Sub-contracted Laboratory Results
- ☐ Customer Specific Data Sheets, Reports, & Documentation
- ☐ Customer Database Entries
- ☑ Chain of Custody
- ☑ Electronic Data Deliverable (EDD) Sent Separately

Reviewed By: DataBase Administrator Date: 6/14/2012

Certificate of Laboratory Analysis

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Order # J12060052

Site: FGD Purge Eff
Collection Date: 01-Jun-12 7:30 AM

Sample #: 2012012224
Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY								
Vendor Parameter	**Complete**				1	V_PRISM		
NITRITE + NITRATE (COLORIMETRIC)								
Nitrite + Nitrate (Colorimetric)	**14**	mg-N/L		0.25	25	EPA 353.2	04-Jun-12 11:37	TLINN
INORGANIC IONS BY IC								
Bromide	**100**	mg/L		5	50	EPA 300.0	04-Jun-12 16:01	BGN9034
Chloride	**7000**	mg/L		100	1000	EPA 300.0	04-Jun-12 16:01	BGN9034
Sulfate	**1200**	mg/L		100	1000	EPA 300.0	04-Jun-12 16:01	BGN9034
MERCURY (COLD VAPOR) IN WATER								
Mercury (Hg)	**237**	ug/L		5	100	EPA 245.1	07-Jun-12 11:43	AGIBBS
Mercury Dissolved (cold vapor) in Water (Filtered)								
Mercury (Hg)	**< 2.5**	ug/L		2.5	50	EPA 245.1	07-Jun-12 12:33	AGIBBS
DISSOLVED METALS BY ICP								
Manganese (Mn)	**7.65**	mg/L		0.05	10	EPA 200.7	04-Jun-12 14:16	MHH7131
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**207**	mg/L		0.5	10	EPA 200.7	06-Jun-12 12:30	MHH7131
Calcium (Ca)	**4770**	mg/L		0.1	10	EPA 200.7	06-Jun-12 12:30	MHH7131
Iron (Fe)	**109**	mg/L		0.1	10	EPA 200.7	06-Jun-12 12:30	MHH7131
Lithium (Li)	**0.170**	mg/L		0.05	10	EPA 200.7	06-Jun-12 12:30	MHH7131
Magnesium (Mg)	**790**	mg/L		0.05	10	EPA 200.7	06-Jun-12 12:30	MHH7131
Manganese (Mn)	**7.66**	mg/L		0.05	10	EPA 200.7	06-Jun-12 12:30	MHH7131
Potassium (K)	**65.3**	mg/L		1	10	EPA 200.7	06-Jun-12 12:30	MHH7131
Sodium (Na)	**47.6**	mg/L		0.5	10	EPA 200.7	06-Jun-12 12:30	MHH7131
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**179**	ug/L		10	10	EPA 200.8	06-Jun-12 13:15	DJSULL1
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**182**	ug/L		10	10	EPA 200.8	05-Jun-12 14:04	DJSULL1
Cadmium (Cd)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:04	DJSULL1
Chromium (Cr)	**242**	ug/L		10	10	EPA 200.8	05-Jun-12 14:04	DJSULL1
Copper (Cu)	**122**	ug/L		10	10	EPA 200.8	05-Jun-12 14:04	DJSULL1
Nickel (Ni)	**201**	ug/L		10	10	EPA 200.8	05-Jun-12 14:04	DJSULL1
Selenium (Se)	**4180**	ug/L		10	10	EPA 200.8	05-Jun-12 14:04	DJSULL1
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:04	DJSULL1
Zinc (Zn)	**257**	ug/L		10	10	EPA 200.8	05-Jun-12 14:04	DJSULL1

Certificate of Laboratory Analysis

Order # J12060052

Site: FGD Purge Eff — **Sample #: 2012012224**
Collection Date: 01-Jun-12 7:30 AM — Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
SELENIUM SPECIATION								
Vendor Parameter	**Complete**				1	V_AS&C		
TOTAL DISSOLVED SOLIDS								
Vendor Parameter	**Complete**				1	V_PACE		
TOTAL SUSPENDED SOLIDS								
Vendor Parameter	**Complete**				1	V_PACE		

Site: BIOREACTOR 1 INF — **Sample #: 2012012230**
Collection Date: 01-Jun-12 7:40 AM — Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY								
Vendor Parameter	**Complete**				1	V_PRISM		
NITRITE + NITRATE (COLORIMETRIC)								
Nitrite + Nitrate (Colorimetric)	**15**	mg-N/L		0.25	25	EPA 353.2	04-Jun-12 11:40	TLINN
INORGANIC IONS BY IC								
Bromide	**96**	mg/L		5	50	EPA 300.0	04-Jun-12 16:19	BGN9034
Chloride	**6900**	mg/L		100	1000	EPA 300.0	04-Jun-12 16:19	BGN9034
Sulfate	**1300**	mg/L		100	1000	EPA 300.0	04-Jun-12 16:19	BGN9034
MERCURY 1631								
Vendor Parameter	**Complete**				1	V_BRAND		
MERCURY (COLD VAPOR) IN WATER								
Mercury (Hg)	**< 2.5**	ug/L		2.5	50	EPA 245.1	07-Jun-12 11:45	AGIBBS
Mercury Dissolved (cold vapor) in Water (Filtered)								
Mercury (Hg)	**< 2.5**	ug/L		2.5	50	EPA 245.1	07-Jun-12 12:35	AGIBBS
DISSOLVED METALS BY ICP								
Manganese (Mn)	**3.58**	mg/L		0.05	10	EPA 200.7	04-Jun-12 14:20	MHH7131

Certificate of Laboratory Analysis

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Order # J12060052

Site: BIOREACTOR 1 INF — **Sample #: 2012012230**

Collection Date: 01-Jun-12 7:40 AM — Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**203**	mg/L		0.5	10	EPA 200.7	06-Jun-12 12:34	MHH7131
Calcium (Ca)	**3390**	mg/L		0.1	10	EPA 200.7	06-Jun-12 12:34	MHH7131
Iron (Fe)	**< 0.1**	mg/L		0.1	10	EPA 200.7	06-Jun-12 12:34	MHH7131
Lithium (Li)	**< 0.05**	mg/L		0.05	10	EPA 200.7	06-Jun-12 12:34	MHH7131
Magnesium (Mg)	**728**	mg/L		0.05	10	EPA 200.7	06-Jun-12 12:34	MHH7131
Manganese (Mn)	**3.52**	mg/L		0.05	10	EPA 200.7	06-Jun-12 12:34	MHH7131
Potassium (K)	**25.1**	mg/L		1	10	EPA 200.7	06-Jun-12 12:34	MHH7131
Sodium (Na)	**46.1**	mg/L		0.5	10	EPA 200.7	06-Jun-12 12:34	MHH7131
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**92.6**	ug/L		5	5	EPA 200.8	06-Jun-12 13:19	DJSULL1
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:07	DJSULL1
Cadmium (Cd)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:07	DJSULL1
Chromium (Cr)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:07	DJSULL1
Copper (Cu)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:07	DJSULL1
Nickel (Ni)	**25.9**	ug/L		10	10	EPA 200.8	05-Jun-12 14:07	DJSULL1
Selenium (Se)	**113**	ug/L		10	10	EPA 200.8	05-Jun-12 14:07	DJSULL1
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:07	DJSULL1
Zinc (Zn)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:07	DJSULL1
SELENIUM SPECIATION								
Vendor Parameter	**Complete**				1	V_AS&C		

Site: biOREACTOR 1 INF HG BLK — **Sample #: 2012012231**

Collection Date: 01-Jun-12 — Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
MERCURY 1631								
Vendor Parameter	**Complete**				1	V_BRAND		

Site: BIOREACTOR 2 EFF. — **Sample #: 2012012245**

Collection Date: 01-Jun-12 7:50 AM — Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY								
Vendor Parameter	**Complete**				1	V_PRISM		

Certificate of Laboratory Analysis

Order # J12060052

Site: BIOREACTOR 2 EFF. **Sample #: 2012012245**

Collection Date: 01-Jun-12 7:50 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
NITRITE + NITRATE (COLORIMETRIC)								
Nitrite + Nitrate (Colorimetric)	**< 0.01**	mg-N/L		0.01	1	EPA 353.2	04-Jun-12 11:41	TLINN
INORGANIC IONS BY IC								
Bromide	**99**	mg/L		5	50	EPA 300.0	04-Jun-12 16:37	BGN9034
Chloride	**7000**	mg/L		100	1000	EPA 300.0	04-Jun-12 16:37	BGN9034
Sulfate	**1300**	mg/L		100	1000	EPA 300.0	04-Jun-12 16:37	BGN9034
MERCURY 1631								
Vendor Parameter	**Complete**				1	V_BRAND		
MERCURY (COLD VAPOR) IN WATER								
Mercury (Hg)	**< 1**	ug/L		1	20	EPA 245.1	07-Jun-12 11:48	AGIBBS
Mercury Dissolved (cold vapor) in Water (Filtered)								
Mercury (Hg)	**< 2.5**	ug/L		2.5	50	EPA 245.1	07-Jun-12 12:37	AGIBBS
DISSOLVED METALS BY ICP								
Manganese (Mn)	**4.49**	mg/L		0.05	10	EPA 200.7	04-Jun-12 14:24	MHH7131
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**210**	mg/L		0.5	10	EPA 200.7	06-Jun-12 12:38	MHH7131
Calcium (Ca)	**3440**	mg/L		0.1	10	EPA 200.7	06-Jun-12 12:38	MHH7131
Iron (Fe)	**< 0.1**	mg/L		0.1	10	EPA 200.7	06-Jun-12 12:38	MHH7131
Lithium (Li)	**< 0.05**	mg/L		0.05	10	EPA 200.7	06-Jun-12 12:38	MHH7131
Magnesium (Mg)	**764**	mg/L		0.05	10	EPA 200.7	06-Jun-12 12:38	MHH7131
Manganese (Mn)	**4.38**	mg/L		0.05	10	EPA 200.7	06-Jun-12 12:38	MHH7131
Potassium (K)	**30.1**	mg/L		1	10	EPA 200.7	06-Jun-12 12:38	MHH7131
Sodium (Na)	**46.3**	mg/L		0.5	10	EPA 200.7	06-Jun-12 12:38	MHH7131
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**5.40**	ug/L		5	5	EPA 200.8	06-Jun-12 14:14	DJSULL1
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:10	DJSULL1
Cadmium (Cd)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:10	DJSULL1
Chromium (Cr)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:10	DJSULL1
Copper (Cu)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:10	DJSULL1
Nickel (Ni)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:10	DJSULL1
Selenium (Se)	**12.9**	ug/L		10	10	EPA 200.8	05-Jun-12 14:10	DJSULL1
Silver (Ag)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:10	DJSULL1
Zinc (Zn)	**< 10**	ug/L		10	10	EPA 200.8	05-Jun-12 14:10	DJSULL1
SELENIUM SPECIATION								
Vendor Parameter	**Complete**				1	V_AS&C		

Certificate of Laboratory Analysis

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Order # J12060052

Site: BIOREACTOR 2 EFF. **Sample #: 2012012245**
Collection Date: 01-Jun-12 7:50 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst

Site: BIOREACTOR 2 EFF. BLANK **Sample #: 2012012246**
Collection Date: 01-Jun-12 Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
MERCURY 1631								
Vendor Parameter	**Complete**				1	V_BRAND		

Site: FILTER BLANK **Sample #: 2012012247**
Collection Date: 01-Jun-12 8:00 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
Mercury Dissolved (cold vapor) in Water (Filtered)								
Mercury (Hg)	**< 0.05**	ug/L		0.05	1	EPA 245.1	07-Jun-12 12:40	AGIBBS
DISSOLVED METALS BY ICP								
Manganese (Mn)	**0.018**	mg/L		0.005	1	EPA 200.7	04-Jun-12 14:04	MHH7131
DISSOLVED METALS BY ICP-MS								
Selenium (Se)	**< 1**	ug/L		1	1	EPA 200.8	06-Jun-12 13:03	DJSULL1

Site: METALS TRIP BLANK **Sample #: 2012012265**
Collection Date: 01-Jun-12 8:10 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
TOTAL RECOVERABLE METALS BY ICP								
Boron (B)	**< 0.05**	mg/L		0.05	1	EPA 200.7	06-Jun-12 11:59	MHH7131
Calcium (Ca)	**0.685**	mg/L		0.01	1	EPA 200.7	06-Jun-12 11:59	MHH7131
Iron (Fe)	**< 0.01**	mg/L		0.01	1	EPA 200.7	06-Jun-12 11:59	MHH7131
Lithium (Li)	**< 0.005**	mg/L		0.005	1	EPA 200.7	06-Jun-12 11:59	MHH7131
Magnesium (Mg)	**0.090**	mg/L		0.005	1	EPA 200.7	06-Jun-12 11:59	MHH7131
Manganese (Mn)	**< 0.005**	mg/L		0.005	1	EPA 200.7	06-Jun-12 11:59	MHH7131
Potassium (K)	**< 0.1**	mg/L		0.1	1	EPA 200.7	06-Jun-12 11:59	MHH7131
Sodium (Na)	**< 0.05**	mg/L		0.05	1	EPA 200.7	06-Jun-12 11:59	MHH7131

Certificate of Laboratory Analysis

Order # J12060052

Site: METALS TRIP BLANK **Sample #: 2012012265**

Collection Date: 01-Jun-12 8:10 AM Matrix: OTHER

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**< 1**	ug/L		1	1	EPA 200.8	05-Jun-12 13:51	DJSULL1
Cadmium (Cd)	**< 1**	ug/L		1	1	EPA 200.8	05-Jun-12 13:51	DJSULL1
Chromium (Cr)	**< 1**	ug/L		1	1	EPA 200.8	05-Jun-12 13:51	DJSULL1
Copper (Cu)	**2.06**	ug/L		1	1	EPA 200.8	05-Jun-12 13:51	DJSULL1
Nickel (Ni)	**< 1**	ug/L		1	1	EPA 200.8	05-Jun-12 13:51	DJSULL1
Selenium (Se)	**1.48**	ug/L		1	1	EPA 200.8	05-Jun-12 13:51	DJSULL1
Silver (Ag)	**< 1**	ug/L		1	1	EPA 200.8	05-Jun-12 13:51	DJSULL1
Zinc (Zn)	**< 1**	ug/L		1	1	EPA 200.8	05-Jun-12 13:51	DJSULL1
SELENIUM SPECIATION								
Vendor Parameter	**Complete**				1	V_AS&C		

PRISM LABORATORIES, INC.
Full-Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert No. 37735
VA Certification No. 1287

Case Narrative

Page No: 1
06/08/2012

Duke Energy Corporation (04)
Jay Perkins
13339 Hagers Ferry Road
Huntersville, NC 28078

Project: HAPS/MACT Testing Belews Creek
Project No.: J12060052
Lab Submittal Date: 06/01/2012
Prism Work Order: 2060015

This data package contains the analytical results for the project identified above and includes a Case Narrative, Sample Results and Chain of Custody. Unless otherwise noted, all samples were received in acceptable condition and processed according to the referenced methods.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative.

Please call if you have any questions relating to this analytical report.

Respectfully,

PRISM LABORATORIES, INC.

VP Laboratory Services

Peggy J Kendall

Reviewed By

Data Qualifiers Key Reference:

HT	Sample received and analyzed outside of the hold time.
BRL	Below Reporting Limit
MDL	Method Detection Limit
RPD	Relative Percent Difference
*	Results reported to the reporting limit. All other results are reported to the MDL with values between MDL and reporting limit indicated with a J.

Sample Receipt Summary

06/08/2012

Prism Work Order: 2060015

Client Sample ID	Lab Sample ID	Matrix	Date Sampled	Date Received
2012012224/FGD Purge Eff	2060015-01	Water	06/01/12	06/01/12
2012012230/BioReactor 1 Inf	2060015-02	Water	06/01/12	06/01/12
2012012245/BioReactor 2 Eff	2060015-03	Water	06/01/12	06/01/12

Samples received in good condition at 3.2 degrees C unless otherwise noted.

449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543
Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

Duke Energy Corporation (04)
Attn: Jay Perkins
13339 Hagers Ferry Road
Huntersville, NC 28078

Project: HAPS/MACT Testing Belews Creek
Project No.: J12060052
Sample Matrix: Water

Client Sample ID: 2012012224/FGD Purge Eff
Prism Sample ID: 2060015-01
Prism Work Order: 2060015
Time Collected: 06/01/12 07:30
Time Submitted: 06/01/12 15:35

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
General Chemistry Parameters									
pH	**7.0 HT**	**pH Units**			**1**	***SM4500-H B**	**6/4/12 13:00**	**JAB**	**P2F0036**
Total Alkalinity	**76**	**mg/L**	**5.0**	**0.66**	**1**	***SM2320 B**	**6/4/12 10:30**	**JAB**	**P2F0028**
Carbonate Alkalinity	BRL	mg/L	5.0	0.66	1	*SM2320 B	6/4/12 10:30	JAB	P2F0029
Bicarbonate Alkalinity	**76**	**mg/L**	**5.0**	**0.66**	**1**	***SM2320 B**	**6/4/12 10:30**	**JAB**	**P2F0030**

Duke Energy Corporation (04)
Attn: Jay Perkins
13339 Hagers Ferry Road
Huntersville, NC 28078

Project: HAPS/MACT Testing Belews Creek
Project No.: J12060052
Sample Matrix: Water

Client Sample ID: 2012012230/BioReactor 1 Inf
Prism Sample ID: 2060015-02
Prism Work Order: 2060015
Time Collected: 06/01/12 07:40
Time Submitted: 06/01/12 15:35

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
General Chemistry Parameters									
pH	**7.0 HT**	**pH Units**			**1**	***SM4500-H B**	**6/4/12 13:00**	**JAB**	**P2F0036**
Total Alkalinity	**44**	**mg/L**	**5.0**	**0.66**	**1**	***SM2320 B**	**6/4/12 10:30**	**JAB**	**P2F0028**
Carbonate Alkalinity	BRL	mg/L	5.0	0.66	1	*SM2320 B	6/4/12 10:30	JAB	P2F0029
Bicarbonate Alkalinity	**44**	**mg/L**	**5.0**	**0.66**	**1**	***SM2320 B**	**6/4/12 10:30**	**JAB**	**P2F0030**

Duke Energy Corporation (04)
Attn: Jay Perkins
13339 Hagers Ferry Road
Huntersville, NC 28078

Project: HAPS/MACT Testing Belews Creek
Project No.: J12060052
Sample Matrix: Water

Client Sample ID: 2012012245/BioReactor 2 Eff
Prism Sample ID: 2060015-03
Prism Work Order: 2060015
Time Collected: 06/01/12 07:50
Time Submitted: 06/01/12 15:35

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
General Chemistry Parameters									
pH	**6.9 HT**	**pH Units**			**1**	***SM4500-H B**	**6/4/12 13:00**	**JAB**	**P2F0036**
Total Alkalinity	**110**	**mg/L**	**5.0**	**0.66**	**1**	***SM2320 B**	**6/4/12 10:30**	**JAB**	**P2F0028**
Carbonate Alkalinity	BRL	mg/L	5.0	0.66	1	*SM2320 B	6/4/12 10:30	JAB	P2F0029
Bicarbonate Alkalinity	**110**	**mg/L**	**5.0**	**0.66**	**1**	***SM2320 B**	**6/4/12 10:30**	**JAB**	**P2F0030**

Duke Energy Corporation (04)
Attn: Jay Perkins
13339 Hagers Ferry Road
Huntersville, NC 28078

Project: HAPS/MACT Testing Belews Creek
Project No: J12060052

Prism Work Order: 2060015
Time Submitted: 6/1/2012 3:35:00PM

General Chemistry Parameters - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P2F0028 - NO PREP										
Blank (P2F0028-BLK1)				Prepared & Analyzed: 06/04/12						
Total Alkalinity	BRL	5.0	mg/L							
LCS (P2F0028-BS1)				Prepared & Analyzed: 06/04/12						
Total Alkalinity	253	5.0	mg/L	250.0		101	90-110			
LCS Dup (P2F0028-BSD1)				Prepared & Analyzed: 06/04/12						
Total Alkalinity	250	5.0	mg/L	250.0		100	90-110	1	200	
Batch P2F0029 - NO PREP										
Blank (P2F0029-BLK1)				Prepared & Analyzed: 06/04/12						
Carbonate Alkalinity	BRL	5.0	mg/L							
LCS (P2F0029-BS1)				Prepared & Analyzed: 06/04/12						
Carbonate Alkalinity	253	5.0	mg/L				90-110			
LCS Dup (P2F0029-BSD1)				Prepared & Analyzed: 06/04/12						
Carbonate Alkalinity	250	5.0	mg/L				90-110	1	200	
Batch P2F0030 - NO PREP										
Blank (P2F0030-BLK1)				Prepared & Analyzed: 06/04/12						
Bicarbonate Alkalinity	BRL	5.0	mg/L							
LCS (P2F0030-BS1)				Prepared & Analyzed: 06/04/12						
Bicarbonate Alkalinity	253	5.0	mg/L	250.0		101	90-110			

Duke Energy Corporation (04)
Attn: Jay Perkins
13339 Hagers Ferry Road
Huntersville, NC 28078

Project: HAPS/MACT Testing Belews Creek
Project No: J12060052

Prism Work Order: 2060015
Time Submitted: 6/1/2012 3:35:00PM

General Chemistry Parameters - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P2F0030 - NO PREP										
LCS Dup (P2F0030-BSD1)				Prepared & Analyzed: 06/04/12						
Bicarbonate Alkalinity	250	5.0	mg/L	250.0		100	90-110	1	200	
Batch P2F0036 - NO PREP										
LCS (P2F0036-BS1)				Prepared & Analyzed: 06/04/12						
pH	6.81		pH Units	6.860		99	99-101			
Duplicate (P2F0036-DUP1)		**Source: 2060015-01**		Prepared & Analyzed: 06/04/12						
pH	7.03		pH Units		7.03			0	10	

24

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-4349

Analytical Laboratory Use Only

LIMS # J1206052 | Matrix: OTHER | Samples Originating From: NC ✓ SC ___
Logged By: AM | Date & Time: 6-1-12 13:40 | Temp (C): 9.9
SAMPLE PROGRAM: Ground Water ___ NPDES ___ Drinking Water ___ UST ___ RCRA ___ Waste ___

[19]Page 1 of 2
DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Customer must Complete

[1]Project Name	HAPS/MACT Testing Belews Creek		[2]Phone No:
[2] Client:	Bill Kennedy, Ron Laws, Allen Stowe, Wayne Chapman, Melonie Martin, Tom Johnson		[4]Fax No:
[5]Business Unit:	20003	[6]Process: 3500	Mail Code:
[8]Oper. Unit:	BC00	[9]Res. Type: 69400	[10]Project ID: MACTCAR

PRISM PO#144725 [redacted] Brooks Rand PO#141391
PACE PO #146146 Customer to cc [redacted] AS&C PO#133241
appropriate non-s[redacted]

[16]Analyses Required

LAB USE ONLY [11]Lab ID	Se Speciation Bottle ID	[13]Sample Description or ID	Date	Time	Signature	[17]Comp.	[18]Grab	TDS, TSS	Hg - 245.1	Metals*	Hg,IMS=Se, ICP=Mn (filtered by station)	Se, Speciation, V_ASC	Hg 1631, V_BRand	Carbonate alkalinity, bicarbonate alkalinity, total (4.5), pH - V_Prism	Chloride, Sulfate, Bromide - Dionex	Nitrate-nitrite, C_NO3/NO2
								HCl	HNO3				None			
								4	3	3	3	4	None	4	4	2,4
20/21/22 ✓		FGD Purge Eff	6/1/12	7:30	W. Work			1	1	1	1	1		1	1	1
30		BioReactor 1 Inf		7:40					1	1	1	1	1	1	1	1
31		BioReactor 1 Inf Hg Blk											1			
45		BioReactor 2 Eff		7:50					1	1	1	1	1	1	1	1
46		BioReactor 2 Eff Hg Blk											1			
47		Filter Blk		8:00							1					
65		Metals Trip Blk		8:10						1		1				

Customer to complete appropriate columns to right

Customer to sign & date below - fill out from left to right.

1) Relinquished By: W. Work	Date/Time: 6/1/12 9:00Am	2) Accepted By: G. C. Sharma	Date/Time: 6/1/12 12:17
3) Relinquished By: Cindy Knox	Date/Time: 6-1-12 1440	4) Accepted By: Dawn Mon	Date/Time: 6-1-12 1440
5) Relinquished By: Dawn Mon	Date/Time: 6/1/12 1535	6) Accepted By: Tony Cole	Date/Time: 6-1-12 1535
7) Relinquished By:	Date/Time:	8) Accepted By:	Date/Time:
9) Seal/Locked By:	Date/Time:	10) Seal/Lock Opened By	Date/Time:
11) Seal/Locked By:	Date/Time:	12) Seal/Lock Opened By	Date/Time:

Comments: * Metals=TRM/IMS = As, Cd, Cr, Cu, Ni, Se, Ag, Zn TRM/ICP = B, Ca, FE, K, Li, Mg, Mn, Na, [illegible]

Customer, IMPORTANT! Please indicate desired turnaround.

[22]Requested Turnaround
14 Days ___
*7 Days ___
*48 Hr ___
*Other 6-11-12
Add. Cost Will Apply

Pr
Pa

3.2

2606615

Pace Analytical Services, Inc.
205 East Meadow Road - Suite A
Eden, NC 27288
(336)623-8921

Pace Analytical Services, Inc.
2225 Riverside Dr.
Asheville, NC 28804
(828)254-7176

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

June 06, 2012

Program Manager
Duke Energy

,

RE: Project: J12060052
Pace Project No.: 92119831

Dear Program Manager:
Enclosed are the analytical results for sample(s) received by the laboratory on June 01, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Herring

kevin.herring@pacelabs.com
Project Manager

Enclosures

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CERTIFICATIONS

Project: J12060052
Pace Project No.: 92119831

Asheville Certification IDs
2225 Riverside Dr., Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia Certification #: 00072
West Virginia Certification #: 356
Virgina/VELAP Certification #: 460147

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SAMPLE SUMMARY

Project: J12060052
Pace Project No.: 92119831

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92119831001	**2012012224**	Water	06/01/12 07:30	06/01/12 15:25

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Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: J12060052
Pace Project No.: 92119831

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92119831001	**2012012224**	SM 2540C	LMD	1	PASI-A
		SM 2540D	LMD	1	PASI-A

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Huntersville, NC 28078
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ANALYTICAL RESULTS

Project: J12060052
Pace Project No.: 92119831

Sample: 2012012224 **Lab ID: 92119831001** Collected: 06/01/12 07:30 Received: 06/01/12 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**16600**	mg/L	500	500	1		06/04/12 19:31		
2540D Total Suspended Solids	Analytical Method: SM 2540D								
Total Suspended Solids	**6460**	mg/L	250	250	1		06/05/12 18:06		

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QUALITY CONTROL DATA

Project: J12060052
Pace Project No.: 92119831

QC Batch: WET/21085
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92119831001

METHOD BLANK: 772818
Matrix: Water
Associated Lab Samples: 92119831001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	06/04/12 19:29	

LABORATORY CONTROL SAMPLE: 772819

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	252	101	80-120	

SAMPLE DUPLICATE: 772821

Parameter	Units	92119843001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	14600	14600	0	10	

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QUALITY CONTROL DATA

Project: J12060052
Pace Project No.: 92119831

QC Batch: WET/21099 Analysis Method: SM 2540D
QC Batch Method: SM 2540D Analysis Description: 2540D Total Suspended Solids
Associated Lab Samples: 92119831001

METHOD BLANK: 773425 Matrix: Water
Associated Lab Samples: 92119831001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	ND	2.5	06/05/12 18:05	

LABORATORY CONTROL SAMPLE: 773426

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Suspended Solids	mg/L	250	256	102	80-120	

SAMPLE DUPLICATE: 773427

Parameter	Units	92119831001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	6460	6090	6	10	

SAMPLE DUPLICATE: 773428

Parameter	Units	92119673001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	13.4	13.4	0	10	

QUALIFIERS

Project: J12060052
Pace Project No.: 92119831

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Acid preservation may not be appropriate for 2-Chloroethylvinyl ether, Styrene, and Vinyl chloride.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A Pace Analytical Services - Asheville

Pace Analytical Services, Inc.
205 East Meadow Road - Suite A
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9800 Kincey Ave. Suite 100
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: J12060052
Pace Project No.: 92119831

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92119831001	**2012012224**	SM 2540C	WET/21085		
92119831001	**2012012224**	SM 2540D	WET/21099		

June 13, 2012

Duke Energy
ATTN: Jay Perkins
Scientific Support-Laboratory
13339 Hagers Ferry Road
Huntersville NC 28078
jcperkins@duke-energy.com
labcustomer@duke-energy.com

RE: Project DUK-HV1201 Client Project: J12060052

Dear Mr. Perkins,

On June 5, 2012, Brooks Rand Labs (BRL) received two (2) wastewater samples and two (2) corresponding field blanks. Samples were logged-in for total mercury (Hg) analysis according to the chain-of-custody form. All samples were received, prepared, analyzed, and stored according to BRL SOPs and EPA methodology.

The results were blank-corrected as described in the calculations section of the applicable SOP(s) and may be evaluated using adjusted reporting limits to account for sample aliquot size. Please refer to the *Sample Results* page for sample-specific detection limits and other details.

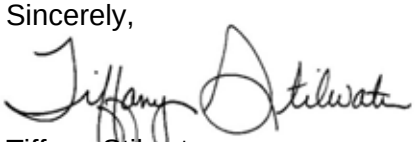
The analysis of the third method blank was elevated. The method blank was re-analyzed two more times and the subsequent results were slightly lower with each analysis. Based on the average of the three analyses, the result obtained from the second analysis was reported as –BLK5.

None of the method blank results were Grubb's outliers and the standard deviation exceeded the acceptance limit. This necessitated the elevation of the batch detection limits. The estimated MDL was determined by multiplying the standard deviation by a factor of three and the estimated MRL was calculated as three times the estimated MDL. Aside from concentration qualifiers, all data was reported without additional qualification and all associated quality control sample results met the acceptance criteria.

BRL, an accredited laboratory, certifies the reported results of all analyses for which BRL is NELAP accredited meet all NELAP requirements. For more details, see the *Report Information* page of the report.

Please feel free to contact me if you have any questions regarding this report.

Sincerely,



Tiffany Stilwater
Project Manager
tiffany@brooksrand.com

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Report Information

Laboratory Accreditation

BRL is accredited by the *National Environmental Laboratory Accreditation Program* (NELAP) through the State of Florida Department of Health, Bureau of Laboratories (E87982) and is certified to perform many environmental analyses. BRL is also certified by many other states to perform environmental analyses. For a current list of our accreditations /certifications, please visit our website at <http://www.brooksrand.com/default.asp?contentID=586>. Results reported relate only to the samples listed in the report.

Field Quality Control Samples

Please be notified that certain EPA methods require the collection of field quality control samples of an appropriate type and frequency; failure to do so is considered a deviation from some methods and for compliance purposes should only be done with the approval of regulatory authorities. Please see the specific EPA methods for details regarding required field quality control samples.

Common Abbreviations

BLK	method blank	**MS**	matrix spike
BRL	Brooks Rand Labs	**MSD**	matrix spike duplicate
BS	laboratory fortified blank	**ND**	non-detect
CAL	calibration standard	**NR**	non-reportable
CCV	continuing calibration verification	**PS**	post preparation spike
COC	chain of custody record	**REC**	percent recovery
CRM	certified reference material	**RPD**	relative percent difference
D	dissolved fraction	**RSD**	relative standard deviation
DUP	duplicate	**SCV**	secondary calibration verification
ICV	initial calibration verification	**SOP**	standard operating procedure
MDL	method detection limit	**SRM**	standard reference material
MRL	method reporting limit	**T**	total recoverable fraction

Definition of Data Qualifiers

(Effective 9/23/09)

B Detected by the instrument, the result is > the MDL but ≤ the MRL. Result is reported and considered an estimate.
E An estimated value due to the presence of interferences. A full explanation is presented in the narrative.
H Holding time and/or preservation requirements not met. Result is estimated.
J Estimated value. A full explanation is presented in the narrative.
J-M Duplicate precision (RPD) for associated QC sample was not within acceptance criteria. Result is estimated.
J-N Spike recovery for associated QC sample was not within acceptance criteria. Result is estimated.
M Duplicate precision (RPD) was not within acceptance criteria. Result is estimated.
N Spike recovery was not within acceptance criteria. Result is estimated.
R Rejected, unusable value. A full explanation is presented in the narrative.
U Result is ≤ the MDL or client requested reporting limit (CRRL). Result reported as the MDL or CRRL.
X Result is not BLK-corrected and is within 10x the absolute value of the highest detectable BLK in the batch. Result is estimated.

These qualifiers are based on those previously utilized by Brooks Rand, Ltd., those found in the EPA SOW ILM03.0, Exhibit B, Section III, pg. B-18, and the USEPA Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses; USEPA; July 2002. These supersede all previous qualifiers ever employed by BRL.

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Sample Information

Sample	Lab ID	Report Matrix	Type	Sampled	Received
BioReactor 1 Inf	1223007-01	Influent	Sample	06/01/2012	06/05/2012
BioReactor 1 Inf Hg Blk	1223007-02	DIW	Field Blank	06/01/2012	06/05/2012
BioReactor 2 Eff	1223007-03	Effluent	Sample	06/01/2012	06/05/2012
BioReactor 2 Eff Hg Blk	1223007-04	DIW	Field Blank	06/01/2012	06/05/2012

Batch Summary

Analyte	Lab Matrix	Method	Prepared	Analyzed	Batch	Sequence
Hg	Water	EPA 1631	06/06/2012	06/08/2012	B120985	1200429

Sample Results

Sample	Analyte	Report Matrix	Fraction	Result	Qualifier	MDL	MRL	Unit	Batch	Sequence
BioReactor 1 Inf										
1223007-01	Hg	Influent	T	298		6.67	20.0	ng/L	B120985	1200429
BioReactor 1 Inf Hg Blk										
1223007-02	Hg	DIW	T	0.33	U	0.33	1.00	ng/L	B120985	1200429
BioReactor 2 Eff										
1223007-03	Hg	Effluent	T	17.4		1.63	4.89	ng/L	B120985	1200429
BioReactor 2 Eff Hg Blk										
1223007-04	Hg	DIW	T	0.33	U	0.33	1.00	ng/L	B120985	1200429

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Accuracy & Precision Summary

Batch: B120985
Lab Matrix: Water
Method: EPA 1631

Sample	Analyte	Native	Spike	Result	Units	REC & Limits	RPD & Limits
B120985-SRM1	**Certified Reference Material (1221029, NIST 1641d 1000x dilution)**						
	Hg		15.68	16.07	ng/L	103% 85-115	
B120985-MS1	**Matrix Spike (1223006-03)**						
	Hg	13.28	69.15	88.09	ng/L	108% 71-125	
B120985-MSD1	**Matrix Spike Duplicate (1223006-03)**						
	Hg	13.28	67.24	87.40	ng/L	110% 71-125	0.8% 24

Method Blanks & Reporting Limits

Batch: B120985
Matrix: Water
Method: EPA 1631
Analyte: Hg

Sample	Result	Units
B120985-BLK1	0.27	ng/L
B120985-BLK2	0.22	ng/L
B120985-BLK4	0.15	ng/L
B120985-BLK5	0.41	ng/L

Average: 0.26 **Standard Deviation:** 0.11 **MDL:** 0.33
Limit: 0.50 **Limit:** 0.10 **MRL:** 0.99

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Instrument Calibration

Sequence: 1200429
Instrument: THG-05
Date: 06/08/2012
Analyte: Hg

Total Mercury and Mercury Speciation by CVAFS
Method: EPA 1631

Lab ID	True Value	Result	Units	REC & Limits	
1200429-IBL1		7.06	pg of Hg		
1200429-IBL2		6.12	pg of Hg		
1200429-IBL3		5.43	pg of Hg		
1200429-IBL4		5.89	pg of Hg		
1200429-CAL1	25.00	24.70	pg of Hg	99%	
1200429-CAL2	100.0	98.50	pg of Hg	98%	
1200429-CAL3	500.0	495.5	pg of Hg	99%	
1200429-CAL4	2500	2546	pg of Hg	102%	
1200429-CAL5	10000	10190	pg of Hg	102%	
1200429-ICV1	1568	1607	pg of Hg	103%	85-115
1200429-CCV1	500.0	513.7	pg of Hg	103%	77-123
1200429-CCB1		11.8	pg of Hg		
1200429-CCV2	500.0	506.3	pg of Hg	101%	77-123
1200429-CCV3	500.0	514.7	pg of Hg	103%	77-123
1200429-CCV4	500.0	535.4	pg of Hg	107%	77-123

Project ID: DUK-HV1201
PM: Tiffany Stilwater

Client PM: Jay Perkins
Client PO: 141391

Sample Containers

Lab ID: 1223007-01
Sample: BioReactor 1 Inf
Report Matrix: Influent
Sample Type: Sample
Collected: 06/01/2012
Received: 06/05/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	250 mL	71392670 10	none	n/a		Cooler

Lab ID: 1223007-02
Sample: BioReactor 1 Inf Hg Blk
Report Matrix: DIW
Sample Type: Field Blank
Collected: 06/01/2012
Received: 06/05/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	250 mL	71392670 10	none	n/a		Cooler

Lab ID: 1223007-03
Sample: BioReactor 2 Eff
Report Matrix: Effluent
Sample Type: Sample
Collected: 06/01/2012
Received: 06/05/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	250 mL	71392670 10	none	n/a		Cooler

Lab ID: 1223007-04
Sample: BioReactor 2 Eff Hg Blk
Report Matrix: DIW
Sample Type: Field Blank
Collected: 06/01/2012
Received: 06/05/2012

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Bottle FLPE Hg-T	250 mL	71392670 10	none	n/a		Cooler

Shipping Containers

Cooler

Received: June 5, 2012 8:45
Tracking No: 472679671764 via FedEx
Coolant Type: Ice
Temperature: 0.5 °C

Description: cooler
Damaged in transit? No
Returned to client? No

Custody seals present? No
Custody seals intact? No
COC present? Yes

1223007

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page 1 of 2 [19]

DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Duke Energy

Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-4349

Analytical Laboratory Use Only

LIMS #: J12060052 | Matrix: OTHER | Samples Originating From: NC ✓ SC ___

Logged By: [illegible] | Date & Time: 6-1-12 13:40

SAMPLE PROGRAM: Ground Water ___ NPDES ___ Drinking Water ___ UST ___ RCRA ___ Waste ___

Cooler Temp (C): 9.9

PRISM
PO#144725

[redacted]
Brooks Rand
PO#141391

PACE
PO #146146

AS&C
PO#133241

Customer to c... appropriate non-s...

1)Project Name	HAPS/MACT Testing Belews Creek
2)Phone No:	
2) Client:	Bill Kennedy, Ron Laws, Allen Stowe, Wayne Chapman, Melonie Martin, Tom Johnson
4)Fax No:	
5)Business Unit:	20003
6)Process:	3500
Mail Code:	
8)Oper. Unit:	BC00
9)Res. Type:	69400
10)Project ID:	MACTCAR

Customer must Complete

LAB USE ONLY [11]Lab ID	Se Speciation Bottle ID	[13]Sample Description or ID	Date	Time	Signature	[17]Comp.	[18]Grab	TDS, TSS	Hg - 245.1	Metals*	Hg,IMS=Se, ICP=Mn (filtered by station)	Se, Speciation, V_ASC	Hg 1631, V_BRand	Carbonate alkalinity, bicarbonate alkalinity, alkalinity, total (4.5), pH - V_Prism	Chloride, Sulfate, Bromide - Dionex	Nitrate-nitrite, C_NO3/NO2
Preservative (HCL / HNO3 / None)								4	3	3	3	4	None	4	4	2,4
2012012224		FGD Purge Eff	6/1/12	7:30	W. Work			1	1	1	1	1		1	1	1
30		BioReactor 1 Inf		7:40					1	1	1	1	1	1	1	1
31		BioReactor 1 Inf Hg Blk											1			
45		BioReactor 2 Eff		7:50					1	1	1	1	1	1	1	1
46		BioReactor 2 Eff Hg Blk											1			
47		Filter Blk		8:00							1					
65		Metals Trip Blk		8:10						1		1				

Customer to complete appropriate columns to right

4 gpk

Customer to sign & date below - fill out from left to right.

Relinquished By	Date/Time	Accepted By	Date/Time
1) Relinquished By: W. Work	6/1/12 9:00Am	2) Accepted By: G. C. Sharma	6/1/12 12:17
3) Relinquished By: Cindy Knox	6-1-12 1440	4) Accepted By: [illegible]	6-1-12 1440
5) Relinquished By: G. C. Sharma	6-1-12 1455	6) Accepted By: [illegible]	6/1/12 1455
7) Relinquished By: [illegible]	6-4-12 1300	8) Accepted By: [illegible]	6/5/12 0845
9) Seal/Locked By	Date/Time	10) Seal/Lock Opened By	Date/Time
11) Seal/Locked By	Date/Time	12) Seal/Lock Opened By	Date/Time

Pr
Pa
R

Comments
* Metals=TRM/IMS = As, Cd, Cr, Cu, Ni, Se, Ag, Zn TRM/ICP = B, Ca, FE, K, Li, Mg, Mn, Na,

Customer, IMPORTANT!
Please Indicate desired turnaround.

[22]Requested Turnaround

14 Days ___
*7 Days ___
*48 Hr ___
*Other 6-11-12

Add. Cost Will Apply

APPLIED SPECIATION
AND CONSULTING, LLC

18804 Northcreek Parkway Bothell, WA, 98011
Tel: (425) 483-3300 Fax: (425) 483-9818
www.appliedspeciation.com

June 12, 2012

Jay Perkins
Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd.
Huntersville, NC 28078
(704) 875-5245

Project: HAPS/MACT Testing Belews Creek (LIMS # J12060052)

Dear Mr. Perkins,

Attached is the report associated with four (4) aqueous samples submitted for selenium speciation analysis on June 4, 2012. The samples were received in a sealed cooler at -0.5°C on June 5, 2012. Selenium speciation analysis was performed via ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS). Any issues associated with the analysis are addressed in the following report.

If you have any questions, please feel free to contact me at your convenience.

Sincerely,

Russell Gerads
Vice President
Applied Speciation and Consulting, LLC

Applied Speciation and Consulting, LLC

Report prepared for:

Jay Perkins
Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd.
Huntersville, NC 28078

Project: HAPS/MACT Testing Belews Creek (LIMS # J12060052)

June 12, 2012

1. Sample Reception

Four (4) aqueous samples in 125mL HDPE bottles (provided by Applied Speciation and Consulting) were submitted for selenium speciation analysis on June 3, 2012. The samples were received on June 4, 2012 in a sealed container at -0.5°C.

The samples were received in a laminar flow clean hood, void of trace metals contamination and ultra-violet radiation, and was designated a discrete sample identifier. An aliquot of each sample was filtered (0.45µm) and each filtrate was stored in a secure, monitored cryofreezer (maintained at a temperature of -80^{o}C) until selenium speciation analysis could be performed via ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS).

2. Sample Preparation

All sample preparation is performed in laminar flow clean hoods known to be free from trace metals contamination. All applied water for dilutions and sample preservatives are monitored for contamination to account for any biases associated with the sample results.

Selenium Speciation Analysis by IC-ICP-CRC-MS Prior to analysis, an aliquot of each sample was filtered with a syringe filter (0.45µm) and injected directly into a sealed autosampler vial. No further sample preparation was performed as any chemical alteration of a sample June shift the equilibrium of the system, resulting in changes in speciation ratios.

3. Sample Analysis

All sample analysis is preceded by a minimum of a five-point calibration curve spanning the entire concentration range of interest. Calibration curves are performed at the beginning of each analytical day. All calibration curves, associated with each species of interest, are

standardized by linear regression resulting in a response factor. All sample results are **instrument blank corrected** to account for any operational biases associated with the analytical platform.

Prior to sample analysis, all calibration curves are verified using second source standards which are identified as initial calibration verification standards (ICV).

Ongoing instrument performance is identified by the analysis of continuing calibration verification standards (CCV) and continuing calibration blanks (CCB) at a minimal interval of every ten analytical runs.

Selenium Speciation Analysis by IC-ICP-CRC-MS Each sample for selenium speciation analysis was analyzed by ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS) on June 8, 2012. An aliquot of each sample is injected onto an anion exchange column and mobilized by a basic (pH > 7) gradient. The eluting selenium species are then introduced into a radio frequency (RF) plasma where energy-transfer processes cause desolvation, atomization, and ionization. The ions are extracted from the plasma through a differentially-pumped vacuum interface and travel through a pressurized chamber (CRC) containing a reaction gas which preferentially reacts with interfering ions of the same target mass to charge ratios (m/z). A solid-state detector detects ions transmitted through the mass analyzer and the resulting current is processed by a data handling system.

Retention times for each eluting species are compared to known standards for species identification.

4. Analytical Issues

The overall analyses went well and no significant analytical issues were encountered. All quality control parameters associated with this sample were within acceptance limits.

The estimated method detection limits (eMDLs) for selenite, selenate, and selenocyanate are generated from replicate analyses of the lowest standard in the calibration curve. Not all selenium species are present in preparation blanks; therefore, eMDL calculations based on preparation blanks are artificially biased low.

The eMDL for methylseleninic acid and selenomethionine is calculated from the average eMDL of selenite, selenate, and selenocyanate. The calibration does not contain methylseleninic acid or selenomethionine due to impurities in these standards which would bias the results for other selenium species.

If you have any questions or concerns regarding this report, please feel free to contact me.

Sincerely,

Russell Gerads
Vice President
Applied Speciation and Consulting, LLC

Selenium Speciation Results for Duke Energy
Project Name: HAPS/MACT Testing Belews Creek
Contact: Jay Perkins
LIMS #J12060052

Date: June 12, 2012
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Sample Results

Sample ID	Se(IV)	Se(VI)	SeCN	MeSe(IV)	SeMe	Unknown Se Species (n)
FGD Purge Eff	87.7	69.8	ND (<2.2)	2.8	ND (<1.7)	0.70 (1)
BioReactor 1 Inf	19.7	63.3	ND (<0.54)	2.05	ND (<0.43)	0.69 (2)
BioReactor 2 Eff	0.46	ND (<0.35)	ND (<0.54)	ND (<0.43)	ND (<0.43)	0 (0)
Metals Trip Blk	0.287	ND (<0.014)	ND (<0.022)	ND (<0.017)	ND (<0.017)	0 (0)

All results reflect the applied dilution and are reported in µg/L
ND = Not detected at the applied dilution
SeCN = Selenocyanate
MeSe(IV) = Methylseleninic acid
SeMe = Selenomethionine
Unknown Se Species = Total concentration of all unknown Se species observed by IC-ICP-MS
n = number of unknown Se species observed

Selenium Speciation Results for Duke Energy
Project Name: HAPS/MACT Testing Belews Creek
Contact: Jay Perkins
LIMS #J12060052

Date: June 12, 2012
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Quality Control Summary - Preparation Blank Summary

Analyte (µg/L)	PBW1	PBW2	PBW3	PBW4	Mean	StdDev	eMDL*	eMDL 10x	eMDL 250x	eMDL 1000x
Se(IV)	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.015	0.39	1.5
Se(VI)	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.014	0.35	1.4
SeCN	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.022	0.54	2.2
MeSe(IV)	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.017	0.43	1.7
SeMe	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.017	0.43	1.7

eMDL = Estimated Method Detection Limit
*Please see narrative regarding eMDL calculations

Quality Control Summary - Certified Reference Materials

Analyte (µg/L)	CRM	True Value	Result	Recovery
Se(IV)	LCS	9.57	9.83	102.7
Se(VI)	LCS	9.48	9.24	97.5
SeCN	LCS	8.92	8.82	98.9
MeSe(IV)	LCS	6.47	5.66	87.4
SeMe	LCS	9.32	8.17	87.6

Selenium Speciation Results for Duke Energy
Project Name: HAPS/MACT Testing Belews Creek
Contact: Jay Perkins
LIMS #J12060052

Date: June 12, 2012
Report Generated by: Russell Gerads
Applied Speciation and Consulting, LLC

Quality Control Summary - Matrix Duplicates

Analyte (µg/L)	Sample ID	Rep 1	Rep 2	Mean	RPD
Se(IV)	FGD Purge Eff	87.7	89.4	88.5	1.9
Se(VI)	FGD Purge Eff	69.8	74.6	72.2	6.7
SeCN	FGD Purge Eff	ND (<2.2)	ND (<2.2)	NC	NC
MeSe(IV)	FGD Purge Eff	2.8	2.8	2.8	0.5
SeMe	FGD Purge Eff	ND (<1.7)	ND (<1.7)	NC	NC

ND = Not detected at the applied dilution
NC = Value was not calculated due to one or more concentrations below the eMDL

Quality Control Summary - Matrix Spike/ Matrix Spike Duplicate

Analyte (µg/L)	Sample ID	Spike Conc	MS Result	Recovery	Spike Conc	MSD Result	Recovery	RPD
Se(IV)	FGD Purge Eff	5560	6118	108.4	5560	6109	108.3	0.2
Se(VI)	FGD Purge Eff	5045	5068	99.0	5045	5087	99.4	0.4
SeCN	FGD Purge Eff	4575	3999	87.4	4575	4021	87.9	0.6

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Page 2 of 5

[19]Page 1 of 2

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(704) 875-5245
Fax: (704) 875-4349

Customer must Complete

1)Project Name	HAPS/MACT Testing Belews Creek	2)Phone No:	
2) Client:	Bill Kennedy, Ron Laws, Allen Stowe, Wayne Chapman, Melonie Martin, Tom Johnson	4)Fax No:	
5)Business Unit: 20003	6)Process: 3500	Mail Code:	
8)Oper. Unit: BC00	9)Res. Type: 69400	10)Project ID: MACTCAR	

Analytical Laboratory Use Only

LIMS # J12060052 | Matrix: OTHER | Samples Originating From NC ✓ SC __

Logged By: [initials] | Date & Time: 6-1-12 1340

Temp (C): 9.9

SAMPLE PROGRAM: Ground Water __ NPDES __ Drinking Water __ UST __ RCRA __ Waste __

PRISM
PO#144725
[redacted]
Brooks Rand
PO#141391
PACE
PO #146146
AS&C
PO#133241
[redacted]
Customer to co... appropriate non-s...

Preserv.: HCL, HNO3, None

LAB USE ONLY [11]Lab ID	Se Speciation Bottle ID	[13]Sample Description or ID	Date	Time	Signature	[17]Comp.	[18]Grab	TDS, TSS	Hg - 245.1	Metals*	Hg,IMS=Se, ICP=Mn (filtered by station)	Se, Speciation, V_ASC	Hg 1631, V_BRand	Carbonate alkalinity, bicarbonate alkalinity, alkalinity, total (4.5), pH - V_Prism	Chloride, Sulfate, Bromide - Dionex	Nitrate-nitrite, C_NO3/NO2
Preservative								4	3	3	3	4	None	4	4	2,4
20120/2224		FGD Purge Eff	6/1/12	7:30	W. Work			1	1	1	1	1		1	1	1
30		BioReactor 1 Inf		7:40					1	1	1	1	1	1	1	1
31		BioReactor 1 Inf Hg Blk											1			
45		BioReactor 2 Eff		7:50					1	1	1	1	1	1	1	1
46		BioReactor 2 Eff Hg Blk											1			
47		Filter Blk		8:00							1					
65		Metals Trip Blk		8:10						1		1				

Customer to complete appropriate columns to right

Customer to sign & date below - fill out from left to right.

Relinquished By	Date/Time	Accepted By	Date/Time
1) W. Work	6/1/12 9:00AM	2) G. C. Sharma	6/1/12 12:17
3) Cindy Knox	6-1-12 1440	4) [signature]	6-1-12 1440
5) G. C. Sharma	6-1-12 1455	6) [signature]	6/1/12 1455
7) [signature]	6-4-12 1300	8) Nancy Cullinan	6/5/12 9:30 Temp -0.5C
9) Seal/Locked By	Date/Time	10) Seal/Lock Opened By	Date/Time
11) Seal/Locked By	Date/Time	12) Seal/Lock Opened By	Date/Time

Comments
* Metals=TRM/IMS = As, Cd, Cr, Cu, Ni, Se, Ag, Zn TRM/ICP = B, Ca, FE, K, Li, Mg, Mn, Na,

Customer, IMPORTANT! Please indicate desired turnaround.

[22]Requested Turnaround
14 Days ______
*7 Days ______
*48 Hr ______
*Other 6-11-12
Add. Cost Will Apply

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy

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13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-4349

Analytical Laboratory Use Only

LIMS # J12060052 | Matrix: OTHER | Samples Originating From: NC ✓ SC ___

Logged By: am | Date & Time: 6-1-12 13:40

Cooler Temp (C): 9.9

SAMPLE PROGRAM: Ground Water ___ NPDES ___ Drinking Water ___ UST ___ RCRA ___ Waste ___

[19]Page 1 of 2
DISTRIBUTION
ORIGINAL to LAB, COPY to CLIENT

PRISM PO#144725
Brooks Rand PO#141391
PACE PO #146146
AS&C PO#133241

Customer to co... appropriate non-s...

Customer must Complete

1)Project Name	HAPS/MACT Testing Belews Creek	2)Phone No:	
2) Client:	Bill Kennedy, Ron Laws, Allen Stowe, Wayne Chapman, Melonie Martin, Tom Johnson	4)Fax No:	
5)Business Unit: 20003	6)Process: 3500	Mail Code:	
8)Oper. Unit: BC00	9)Res. Type: 69400	10)Project ID: MACTCAR	

Preservative: HCL / HNO3 / None

LAB USE ONLY [11]Lab ID	Se Speciation Bottle ID	[13]Sample Description or ID	Date	Time	Signature	[17]Comp.	[18]Grab	TDS, TSS (4)	Hg - 245.1 (3)	Metals* (3)	Hg,IMS=Se, ICP=Mn (filtered by station) (3)	Se, Speciation, V_ASC (4)	Hg 1631, V_BRand (None)	Carbonate alkalinity, bicarbonate alkalinity, alkalinity, total (4.5), pH - V_Prism (4)	Chloride, Sulfate, Bromide - Dionex (4)	Nitrate-nitrite, C_NO3/NO2 (2,4)
20120122 24		FGD Purge Eff	6/1/12	7:30	W. Work			1	1	1	1	1		1	1	1
30		BioReactor 1 Inf		7:40					1	1	1	1	1	1	1	1
31		BioReactor 1 Inf Hg Blk											1			
45		BioReactor 2 Eff		7:50					1	1	1	1	1	1	1	1
46		BioReactor 2 Eff Hg Blk											1			
47		Filter Blk		8:00							1					
65		Metals Trip Blk		8:10						1		1				

Customer to complete appropriate columns to right

Customer to sign & date below - fill out from left to right.

Relinquished By	Date/Time	Accepted By	Date/Time
1) W. Work	6/1/12 9:00AM	2) G. C. Sharma	6/1/12 12:12
3) Cindy Knox (Pr)	6-1-12 1440	4) David Moi	6-1-12 1440
5) G. C. Sharma (Pa)	6-1-12 1455	6) [illegible] Pace	6/1/12 1455
7)		8)	
9) Seal/Locked By		10) Seal/Lock Opened By	
11) Seal/Locked By		12) Seal/Lock Opened By	

Comments

* Metals=TRM/IMS = As, Cd, Cr, Cu, Ni, Se, Ag, Zn TRM/ICP = B, Ca, FE, K, Li, Mg, Mn, Na,

Customer, IMPORTANT! Please indicate desired turnaround.

[22]Requested Turnaround

14 Days ___
*7 Days ___
*48 Hr ___
*Other 6-11-12
*Add. Cost Will Apply